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AGRICULTURAL EXPERIMENT STATION
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Some Common Lady Beetles of Connecticut.

FIG. 1. The fifteen-spotted lady beetle; larva, pupae and adult. Twice enlarged.

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SOME COMMON LADY BEETLES OF CONNECTICUT.

By W. E. Britton, *State Entomologist.*

The beetles commonly known as lady beetles, "lady- birds" "lady bugs" or plant-louse beetles are among the best friends of the farmer or plant grower, because they feed in both larval and adult stages upon plant-lice, scale-insects and the small larvæ and eggs of other and larger noxious insects. With the exception of one species, *Epilachna borealis Fabr.,* known as the squash lady beetle, all lady beetles occurring in Connecticut are carnivorous and predatory, feeding on the smaller insects many of which are pests of cultivated plants. Hence we call them beneficial. Dr. S. A. Forbes examined the stomach contents of 39 specimens, and found that one-fourth of their food was composed of plant lice; though they ate some vegetable food such as pollen and the spores of fungi, a greater portion of their food consisted of insects.

Though many persons are more or less familiar with lady beetles, some are not acquainted with their habits or life histories, and do not, therefore, recognize them as friends.

The purpose of this bulletin is to point out the beneficial habits of lady beetles, and to show the appearance of our common species so that they may be protected and encouraged and not destroyed.

Professor V. L. Kellogg writes in *American Insects* "A friend of mine found that his roses were suffering from insect attack: he saw little, convex, black-spotted reddish beetles clambering busily up and down the stems, and he set to work to pick them off one by one and drop into a tin cup with petroleum in the bottom. When he had a full pint he showed them proudly. But the more little round beetles he picked off the more rapidly wilted his roses. And for the wholly sufficient reason that he was collecting and killing lady-birds that were making a fight .....against the hosts of tiny inconspicuous green rose-aphids that were sucking the sap out of the rose-stems and buds". I am certain that most entomologists have had experiences much like that of Professor Kellogg.

Blatchley in his Coleoptera of Indiana, page 508, estimates that about 250 known species of lady beetles occur in this country. More than thirty species and varieties representing 17 genera all taken in Connecticut, are in the Station collection. Several other species which we have not yet taken will probably be found within the borders of the State. Sixty-three species are listed from New Jersey.

In the system of insect classification, lady beetles belong to the order Coleoptera (Beetles) and to the family Coccinellidæ. They are easily recognized by their convex elongated hemispherical shape, their three-jointed tarsi and their usually conspicuous markings. Though some species are entirely black, most kinds are black with red or yellow spots, or red or yellow with black spots. The wing-covers of most species are smooth and shiny and the beetles are well able to fly from one plant to another. Our largest species is not more than three-eighths of an inch long, and the smallest measures less than one-twentieth of an inch.

Though the immature stages of the various kinds of lady beetles differ somewhat, in general the eggs are oval, light yellow in color, and are laid in clusters, each egg being fastened by one end to the leaf or bark of the plant upon which its food insect lives. Such an egg-cluster is shown in figure 9.

The larvæ of lady beetles are alligator-shaped grubs, usually seen running around on foliage, especially if infested with plant lice, and are three-fourths of an inch or less in length with prominent legs, and with body tapering backward, and often covered with warts or spines. Some species are nearly black, some gray, and others are spotted or checkered with bright colors, the general appearance being shown in figure 9.

When the larva is fully grown it fastens itself by the tail to a leaf, stem, or other convenient object, the larval skin pushes upward and forms a wad at the tail, and the insect changes to the pupa (or chrysalid) stage, as shown in the center of figure 9. In this stage the insect only slightly resembles the adult and much less the larva. From the pupæ the adults soon emerge, mate, and with certain species the females lay eggs for the second generation; most species of lady beetles, however, probably have only one generation each season. Some, perhaps most kinds, pass the winter as adult beetles; some

kinds are found in houses or other buildings and some kinds hide under loose bark, stones, or wherever they can find shelter.

Recently in Virginia certain lady beetles, especially *Megilla fuscilabris* and *Hippodamia convergens* were found parasitized by a small four-winged fly, *Perilitus americanus* Riley, which lays its eggs between the abdominal segments of its host.

Though most lady beetles are insectivorous and prey upon various kinds of plant lice and scale insects, Burgess observed that *Adalia bipunctata* devoured its own eggs even when plenty of other food was available and within easy reach.*

The most conspicuous example in history of controlling a pest by means of lady beetles occurred in California, some twenty-five years ago. An Australian insect known as the fluted or cottony cushion scale, *Icerya purchasi* Mask., appeared in California on orange trees and spread so rapidly over the state that the extensive orange growing industry was threatened. By request Mr. Albert Koebele was appointed an agent of the United States to attend the Melbourne Exposition, and while in Australia paid special attention to searching for the insect enemies of the fluted scale. A lady beetle, *Vedalia cardinalis* Muls., was found feeding upon the scale and specimens were collected, and five separate lots (altogether about 500 specimens) were brought from Australia to California and placed upon the scale-infested trees. The lady beetles multiplied and their progeny were soon transported to each orange growing section. In a few years the cottony cushion scale had been brought under complete control by the Australian lady beetle; it has never since done much damage on the Pacific coast, and the orange industry still flourishes.

In a less striking manner and on a smaller scale our native lady beetles are continually demonstrating their ability to clean up shrubs, trees and even orchards, which were severely attacked by plant lice.

LADY BEETLES OF GREATEST ECONOMIC IMPORTANCE IN CONNECTICUT.

For controlling aphids and scale insects on cultivated plants in Connecticut the most important species are *Adalia bipunct-*

*Bureau of Entomology, Bull. 40, p. 27, 1903.

ata, Anatis xv-punctata, Chilocorus bivulnerus, Coccinella ix-notata, Cycloneda munda, Hippodamia convergens, H glacialis, H. xiii-punctata H. parenthesis, Hyperaspis signata, Megilla fuscilabris, and *Pentilia misella.*

THE DIFFERENT SPECIES OCCURRING IN CONNECTICUT.

The following notes give about all the information obtainable regarding the food habits, and distribution in Connecticut of the different species of lady beetles as well as how to distinguish them. Several of the species are cosmopolitan, or nearly so, though perhaps more abundant in certain localities than others. For food records all of the principal publications dealing with American economic entomology have been examined, and the data from our own collections and laboratory and field notes have been included.

Coccidula lepida Lec.

Color, wing-covers orange or light-brown, marked with black at base and along the outer margins for nearly two-thirds their length; the inner margins one-third their length from the distal extremity are crossed by a common oval black spot. Thorax orange or light brown like wing-covers, without spots, head black. Legs and underside of prothorax and abdomen orange or light brown; underside of meso-and meta-thorax black.

Length 3 mm.; narrow, more elongated and less hemispherical in shape than most lady beetles.

Immature stages and food habits unknown to the writer. Not common, except perhaps locally. Occurs in swamps. The Station collection has but one specimen, taken in Hamden.

Scymnus species.

To this genus belongs a number of species, of which five have been found in Connecticut. All are black with a short whitish pubescence and certain species are marked with orange on the head, thorax or tips of wing-covers. All are small and would hardly be noticed except by entomologists.

Length, 1.5 to 2.5 mm.

Apparently little is known about the immature stages or life history, though Burgess has reared one species from a black larva with whitish wax-like coating, found feeding upon aphids on burdock.

S. punctatus is recorded as feeding upon red spider, clover mite, and upon the citrus white fly in Florida: *S. terminatus* upon the melon aphis: *S. quadripustulatus* upon the spring grain aphis or "green bug".

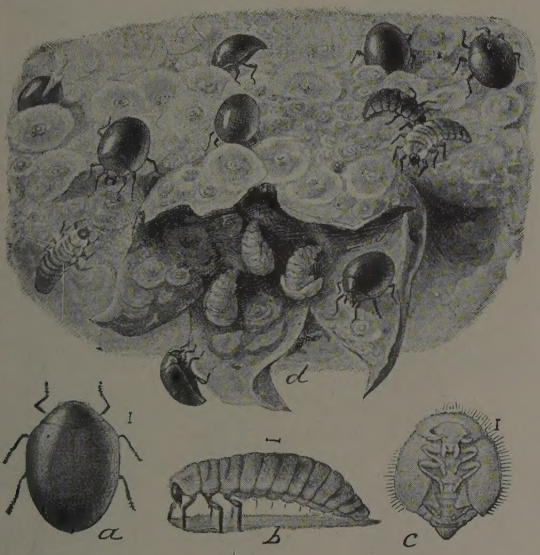

FIG. 2. *Pentilia misella* LeC. *a*, beetle; *b*, larva; *c*, pupa; *d*, blossom end of scale-infested pear, showing beetles and their larvæ feeding upon the scales, all greatly enlarged. (After Howard & Marlatt, Bull. 3, N. S. Div. of Ent., U. S. Department of Agriculture.)

The records of the species in the Station collection are as follows:

S. americanus Muls., New Haven, Scotland; *S. brullei* Muls., Branford; *S. collaris* Muls., Yalesville; *S. fraternus* Lec., Hamden, New Haven; *S. puncticollis* Lec., New Haven, Scotland; *S. tenebrosus* Muls., New Haven. Probably several other species occur in Connecticut as 21 species are listed from New Jersey.

Pentilia misella Lec. *(Smilia misella: Microweisia misella).*

Color, uniformly black throughout: dorsal surface shiny.

Length, 1 mm. or less.

Figure 2, shows adult, larval and pupal stages.

The smallest lady beetle mentioned in this bulletin, and the most important one as a destroyer of the San José Scale. It is locally common on badly infested trees and is recorded as feeding on aphis on elm.

Our records show that it has been collected in Hartford, Mt. Carmel and New Haven.

Hyperaspis fimbriolata Mels., and **H. undulata** Say.

Color, black with wavy yellow margins on thorax and wing-covers, and a yellow oval discal spot.

Length, 2 to 3 mm.

Little is known of the immature stages, life history or habits of these species. *H. undulata* is said to feed upon the spring grain aphis or "green bug".

Our specimens are all from New Haven.

The Signate Lady Beetle, *Hyperaspis signata* Oliv., var. *binotata* Say.

Color, wing-covers, thorax and head black, a red circular discal spot on each wing-cover. Male with head and front and lateral margins of thorax yellow. In the type there is a subapical red or yellow spot on each wing-cover about one-fourth the size of the discal spot.

Length, 2.5 mm.

Variety *binotata* Say., is somewhat larger and lacks the subapical spots. Variety *proba* Say., is smaller and has two subapical spots.

The larva is white and woolly. The species is a great destroyer of cottony maple scale (*Pulvinaria vitis*) and cleaned up some badly infested trees in New Jersey in 1905-'06. It also feeds upon the woolly maple leaf scale (*Phenacoccus acericola*) and the tulip scale.

The Station collection contains specimens of the variety *binotata* from East River, New Haven and Oxford, and of the variety *proba* from New Haven.

Brachyacantha ursina Fabr.

Color, wing-covers black with five orange spots on each; thorax black, with lateral margins and sometimes front margin marked with orange or light yellow. Head black, area between the eyes suffused with orange. Underside of body dark brown or black. Legs, femora dark brown or black, tibiæ and tarsi orange.

Length, 3 to 4 mm. See figure 3. Little has been published regarding the immature stages.

Very common on native plants and collectors gather them in great numbers when "sweeping" but is seldom seen on cultivated plants. At Hartford it was observed feeding on aphids on a plum tree, but we have no other food records.

This lady beetle doubtless occurs throughout the state, and the Station collection contains specimens and records from

FIG. 3. *Brachyacantha ursina.*

FIG. 4. *Delphastus pusillus.* Larva feeding upon *Aleyrodes.*

Branford, East Haven, Hartford, New Haven, Norwalk, Orange, Scotland, Stonington, Torrington, Wallingford, Wethersfield and Windsor.

Delphastus pusillus Lec. (*Cryptognatha pusillus.*)

Color, wing-covers and thorax, black without markings. Head and legs yellow.

Length, 1 to 2 mm. A small inconspicuous species and economically unimportant.

Larva first described from Connecticut by the present writer. Length about 4 mm., ground color gray or dirty white with a white median line extending the whole length of the body; two pear-shaped black spots on first thoracic segment as shown in figure 4. The pupa is cream color.

Feeds upon *Aleyrodes coryli* infesting the hazel bush.

Taken only at Poquonock in the town of Windsor.

The Twice-Stabbed Lady Beetle, *Chilocorus bivulnerus* Muls.

Color, wing-covers black with a blood red circular or elliptical spot near the center of each. Head, thorax and legs, black. Underside of thorax black, abdomen red. Almost hemispherical in shape with the thorax indented or drawn

FIG. 5. The twice-stabbed lady beetle; twice enlarged.

FIG. 6. Pupa cases of the twice-stabbed lady beetle; twice enlarged.

within the circumference formed by the horizontal flange of the margins of the wing-covers. Shown in figure 5.

Length 4 to 5.5 mm.

The larva is spiny. The pupa is black and covered with spines as shown in figure 6. There is but one generation each year and the eggs are laid singly under the shells of scale insects and under the edges of the bark.

This is one of the most important lady beetles feeding upon the San José Scale. It also feeds upon the scurfy scale, cherry scale, Putnam's scale, Howard's scale in Colorado, pine leaf scale, pine bark scale, cottony maple scale, woolly maple leaf scale, an orange scale (*Lepidosaphes gloveri*) and the citrus white fly in Florida, hop aphis, melon aphis, rosy apple aphis, *Myzus sp.*, aphid on burdock, and the Colorado potato beetle. An adult has been observed to eat 50 birch aphid eggs daily.

It is found commonly throughout the state, but there are definite records as follows: Bloomfield, Farmington, Hartford, Milford, New Britain, New Canaan, New Haven, New London, Norfolk, Norwich, Rainbow, South Coventry, Stonington, Stratford, Wallingford and Waterbury.

The Squash Lady Beetle, *Epilachna borealis* Fabr.

Color, wing-covers yellow, each bearing seven black spots, two of which are sutural. Thorax yellow with four black

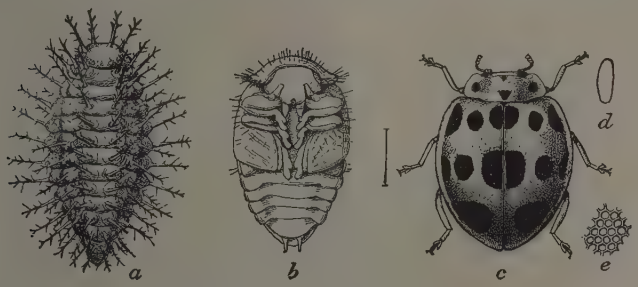

FIG. 7. The squash lady-beetle; *a*, larva; *b*, pupa; *c*, adult beetle, three times natural size; *d*, egg, four times natural size; *e*, surface of same highly magnified. (After Chittenden, Bulletin 19, Bureau of Entomology, U. S. Department of Agriculture.)

spots, one on front and one on rear margin on median line, one near each lateral margin, variable. Head and legs yellow. Undersurface varying from yellow to dark brown. Shown in figure 7.

Length 8 to 10 mm.

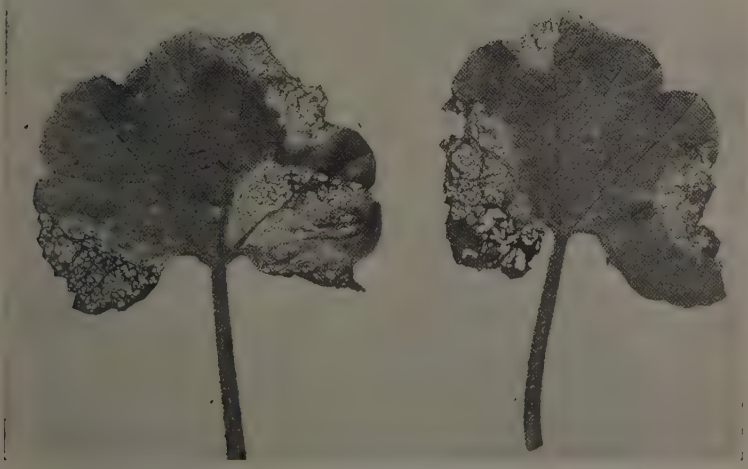

FIG. 8. Work of the squash lady beetle; greatly reduced.

The larva is yellow with black branching spines, and about half an inch long. Except for the 15-spotted lady beetle this is the largest species found in Connecticut, and it is the only species causing serious injury to plants. Both larvæ and adults feed upon the leaves of cucurbits, particularly squash, causing the damage shown in figure 8. The larvæ feed upon the underside of the leaves while the adults are usually upon the upper side. It has also been observed to feed upon ragweed. There is probably only one brood each year. As a pest it can easily be controlled by spraying the leaves with lead arsenate. An account of this insect may be found in the Report of this Station for 1908, page 810.

Though the squash lady beetle occurs throughout the state, our specimens are from Hartford, Ledyard, New Haven and Norwalk.

A closely related species *E. corrupta* injures beans in the southwestern states.

The Twenty-Spotted Lady Beetle, *Psyllobora xx-maculata* Say.

Color, wing-covers light yellow, each marked with eight black spots. The thorax has four black spots on a yellow ground work, thus giving the beetle its name. The arrangement of the spots is shown in figure 10. Head and legs yellow. Undersurface brown.

Length, 2.5 mm.

Larva white; a pair of dusky spots on prothorax; a pair of similar spots each side of median line on meso-thorax and meta-thorax. Two dusky spots on first abdominal segment, four spots on each of second to sixth segments; two on each of seventh and eighth. Tarsi dusky.

Length, 4 mm.

There are few definite food records. The species is supposed to feed upon plant lice.

Our specimens are from Branford, Hamden, New Haven and Portland.

The Fifteen-Spotted Lady Beetle, *Anatis xv-punctata* Oliv.

Color varies from light reddish yellow to dark reddish brown with eight spots on each wing-cover, arranged as shown in figure 9. Thorax black, laterally with broad whitish margins containing a triangular black spot on each side; two whitish spots at rear margin. Underside of body black with margins reddish yellow or brown. Legs, femora black, tibiæ and tarsi brown. Over-wintered specimens are often so dark that the spots on the wings are obliterated.

Length, 10 mm. Our largest lady beetle.

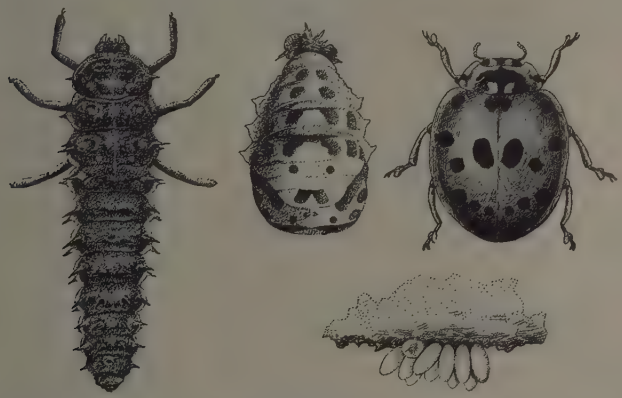

FIG. 9. The fifteen-spotted lady beetle in all its stages; enlarged about three times.

The eggs are light yellow, oval, and are laid in clusters of ten or twelve usually on the underside of the larger branches of the tree. The larva is about three-fourths of an inch long nearly black, with sharp tubercles or short spines on each segment, and is very active in catching and devouring plant lice. The pupa is light yellow with brown spots, and is fastened to the bark or surface of a leaf. Shown also on front cover of this bulletin.

The 15-spotted lady beetle was very abundant in 1909 and 1910 and served as an effective check on the rosy apple aphis. It is most commonly found on shade and orchard trees.

The food records follow: Green and rosy apple aphids, aphid on peach, cherry aphis, current aphis, plum aphis, aphids on poplar, a birch aphid probably *Callipterus betulaecolens*, the aphid probably *Chaitophorus aceris* commonly infesting Norway maples in early summer, elm aphis (*Callipterus ulmifolii*), larvæ of the Colorado potato beetle, the cottony maple scale, woolly maple leaf scale (*Phenacoccus acericola*), gypsy and brown-tail moth caterpillars.

This department has specimens and records from the following localities in Connecticut; Clintonville, Danbury, East Haven, East River, Fairfield, Hamden, Hartford, Meriden, New Canaan, New Haven, Niantic, North Haven, Orange, Rainbow, Southport, Stafford, Stonington, Stratford, Thompson, Wallingford, Westbrook and Woodbridge.

FIG. 10. The twenty-spotted lady beetle.

FIG. 11. The painted lady beetle.

The Painted Lady Beetle. *Harmonia picta* Rand. *(Cleis picta.)*

Color, wing-covers light yellow (sometimes greenish) marked with double black lunules. Thorax and head also light yellow ornamented with black markings, more easily illustrated than described, and shown in figure 11. Underside, body black, thorax black, marked with light yellow on lateral margins and between front and middle pairs of legs. Legs, honey yellow.

Length 4 to 5 mm.

Immature stages apparently unknown. Not common but found in pine trees in early spring.

It is recorded as feeding upon pine leaf scale, (*Chionaspis pinifoliae*) and the pine bark scale (*Chermes pinicorticis*), and various aphids.

Specimens in the Station collection are from Stonington and Wallingford.

Another species *H. similis* Rand, is black with a red crescent mark on each wing-cover. Our collection contains only one specimen from East River.

The Nine-Spotted Lady Beetle. *Coccinella novemnotata* Hbst. *(ix-notata.)*

Color, red or reddish brown or yellow with four black spots on each wing-cover and a common one on the inner margin near the base; hence the name. Thorax black with front margin red or yellow; head red or yellow. Legs and entire undersurface black. Shown in figure 12.

Length, 5.5 to 7 mm.

FIG. 12. The nine-spotted lady beetle.

FIG. 13. The five-spotted lady beetle.

The larva has black markings on the thoracic segments and whitish markings on the first, fourth, sixth and seventh abdominal segments. Thirty days are required for this species to develop from the egg to the adult stage.

This is a common and important species for checking plant lice, and on account of its rather large size is more often noticed than the smaller species. An adult has been known to eat 100 aphids daily. It has been recorded as feeding upon the pea aphis, melon aphis, cabbage aphis, hop aphis, currant aphis, woolly apple aphis, plum aphis, birch aphis, rose aphis, spring grain aphis or "green bug", European grain aphis, German grain aphis. alfalfa weevil, Colorado potato beetle, and red spider.

We have records and specimens from Branford, Danbury, Meriden, Milford, New Canaan, New Haven, North Haven, Sachems' Head, South Lyme, Stafford, Stonington, Wallingford and Woodmont. It occurs all over the state.

The Five-Spotted Lady Beetle. *Coccinella transversoguttata* Fabr. *(v-notata.)*

Color, wing-covers red, marked with a basal cross-band as in *C. trifasciata;* the middle and rear bands, however, are much shorter than in that species often being little more than elongated dots. See figure 13. Thorax black, with front half of lateral margins yellow; head black with two yellow spots between the eyes. Legs and undersurface black.

Length, 6 to 8 mm. The largest species of the genus *Coccinella* found in Connecticut. Not common.

It has been recorded as feeding on the hop aphis, woolly apple aphis and the European grain aphis.

Specimens from Manchester, Middletown, New Haven, Thompson and Wallingford are in the Station collection.

FIG. 14. The three-banded lady beetle.

FIG. 15. The red lady beetle.

The Three-Banded Lady Beetle. *Coccinella trifasciata* Linn. *(perplexa* Mels.*)*

Color, wing-covers light yellow or red, each crossed by three black bands, the front band reaching the inner, but not the lateral, margins; the middle and rear bands not extending to either margin. Thorax black with light yellow or reddish front margin; head black, light yellow or red between the eyes. Legs and undersurface black. Shown in figure 14.

Length, 4 to 5 mm.

The writer is not familiar with the immature stages. Burgess found that one adult ate 100 eggs daily of the birch aphid; it also fed on several other kinds of aphids.

The species probably occurs throughout Connecticut. Our records are as follows: Branford, Hamden, Hartford, Manchester, New Haven, Portland, Stafford, Wallingford, Woodbury and Yalesville. This species, though common on native vegetation is not as abundant on cultivated plants as the preceding species.

A single specimen of another species as yet unidentified which may prove to be a form of *C. monticola* Muls., was collected at Wallingford.

The Red Lady Beetle. *Cycloneda munda* Say. (Erroneously *Coccinella sanguinea*, a tropical species.)

Color, wing-covers dull red or yellow without spots. Thorax black with front margin yellow and ornamented as shown in figure 15. Head black, marked with yellow between the eyes. Underside of body black, legs yellow.

Length, 4 to 5 mm.

This lady beetle has been recorded as feeding upon the pea aphis, melon aphis, hop aphis, spring grain aphis or "green bug", aphid on birch, chinch bug, Colorado potato beetle, and the citrus white fly and the purple scale in Florida.

The species is common on native and cultivated plants and serves as a check to plant lice. It occurs all over the state. Our records are as follows: Branford, East River, Hartford, New Haven, Portland, Stafford, Stonington and Wallingford.

The Two-Spotted Lady Beetle. *Adalia bipunctata* Linn.

Color, wing-covers light red with a circular or irregular-shaped black spot nearly in the center of each. Thorax black with lateral margins yellow, sometimes two yellow spots on

FIG. 16. The two-spotted lady beetle.

FIG. 17. *Adalia humeralis.*

rear margin; head usually black but sometimes with two small yellow spots. Legs and underside of body, black. Shown in figure 16.

Probably the commonest of our lady beetles. It hibernates in houses, often occurring in considerable numbers with elm leaf beetles. Nearly every year, some good housewife sends specimens to this office with a statement that they were eating

her carpets and asks for a remedy. It is often difficult to convince her that another insect, the carpet beetle is responsible for the damage, and that the two spotted lady beetle is one of her friends and should be protected. The same mistake has been made frequently in New York and other states.

This species feeds chiefly on plant lice; the adults have been observed to devour 100 aphid eggs daily. We have food records as follows: Eggs and adults of pear psylla, green and rosy apple aphids, pea aphis, cherry aphis, currant aphis, hop aphis, rose aphis, aphids on peach and plum, cabbage aphis, honeysuckle aphis, birch aphis, Norway maple aphis (*Chaitophorus aceris*) aphid on buckthorn, aphid on *Hydrangea*, elm aphis (*Callipterus ulmifolii*) elm scale (*Gossyparia spuria*), and eggs of its own species.

The two-spotted lady beetle occurs throughout the state. We have specimens and records from Branford, Bridgeport, Glastonbury, Hartford, Ledyard, Meriden, New Haven, North Haven, Southbury, South Lyme, Stonington, Suffield, Wallingford, Westport and Windsor.

Adalia humeralis Say.

This species shown in figure 17, considered by some to be a variety of *bipunctata,* has black wing-covers with red spots, and red on the outside of each wing-cover at the base. The size of these marks vary greatly in a series of specimens. The thorax is black with lateral margins yellow. Size as in *bipunctata.* Comparatively rare.

Has been observed feeding on plant lice in Oregon and California. We have adults from New Haven, Stonington and Wallingford.

The Convergent Lady Beetle. *Hippodamia convergens* Guer.

Color, wing-covers dark red or yellow, each marked with six black dots as shown in figure 18. Thorax black with front and lateral margins yellow, and two oblique yellow bars as figured. Head black, with yellow between the eyes. Legs and undersurface entirely black.

Length, 6 to 7 mm.

Larva, first thoracic segment yellow marked with four black spots; second and third gray with yellow median line dividing a black cross-band on each segment. First and fourth abdominal segments yellow; fifth, sixth and seventh marked laterally with yellow.

According to published records this species feeds upon pea aphis, melon aphis, cabbage aphis, cotton aphis, hop aphis, plum aphis, cherry aphis, spring grain aphis or "green bug", European grain aphis, German grain aphis, aphis on cactus, woolly apple aphis, bean thrips, alfalfa weevil, chinch bug, red spider, eggs of grape root worm, asparagus beetle larvæ, and eggs of the Colorado potato beetle. Professor S. J. Hunter found that the adult would eat from 50 to 60 "green bugs" (aphids) per day.

FIG. 18. The convergent lady beetle.

FIG. 19. The glacial lady beetle.

This is the lady beetle which is gathered in large quantities from near the snow line of the Sierra Mountains where it hibernates and distributed to melon and other truck growers in California, about 30,000 being considered sufficient for ten acres. Several tons of lady beetles, are thus distributed from the state insectary each year*.

This is considered the most important lady beetle in controlling the cabbage aphis in New York state.

Though this species is apparently less common in Connecticut than some other lady beetles, it is an important destroyer of plant lice.

Our specimens are from New Canaan, New Haven, Woodbury and Yalesville.

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*Monthly Bulletin, California State Commission of Horticulture, Vol. I, pp. 71-81, 1912.

The Glacial Lady Beetle. *Hippodamia glacialis* Fabr.

Color, wing-covers red or dark yellow, each marked with black spots as follows; a small one at base, a large one at apex and a cross-band or double spot at the apical third. Thorax black with yellow front and lateral margins, with oblique yellow bars as in *H. convergens.* Head black with diamond-shaped yellow spot between the eyes. Legs and undersurface black. See figure 19.

Length, 6 to 8 mm.

The writer is not familiar with the immature stages of this lady beetle.

The published food records are as follows; pea aphis, cabbage aphis, melon aphis, clover aphis, German grain aphis, chinch bug, larva of Colorado potato beetle. An important enemy of the melon aphis and other plant lice.

FIG. 20. The parenthesis lady beetle.

FIG. 21. The thirteen-spotted lady beetle.

Occurs over the state; our records are from Branford, East Haven, Manchester, Milford, Mount Carmel, New Haven, Newington, Prospect, Southington, Stratford and Stonington.

The Parenthesis Lady Beetle. *Hippodamia parenthesis* Say.

Color, wing-covers red or yellow marked with black as follows; a parenthesis mark near apex, and a small spot at base of each; a triangular common spot at base on inner margins. Thorax black with narrow yellow margin in front and laterally. Front margin projects backward to a point on median line and a yellow median spot at rear margin. Head black with three small yellow diamond-shaped spots between the eyes. Legs and undersurface, black. Shown in figure 20.

Length, 4 to 5 mm.

No description of the larva can be given. Habits much the same as the preceding. This species feeds upon melon aphis, clover aphis, spring grain aphis or "green bug" and European grain aphis.

Apparently this species occurs throughout the state. Specimens in the Station collection are from Bantam, Branford, Cromwell, Hamden, Meriden, Milford, New Haven, North Haven, Prospect, Scotland, Southington, Torrington, Wallingford and Yalesville.

The Thirteen-Spotted Lady Beetle. *Hippodamia xiii-punctata* Linn.

Color, wing-covers red or yellow, each marked with six circular or oblong spots as shown in figure 21, and a small oval common spot at the base on the inner margin. Thorax black with a rather broad front and lateral yellow margin. Head black, mouth parts yellow. Undersurface of body and femora black, tibiæ and tarsi yellow.

Length, 4.5 to 5.5 mm.

I have found no description of the larva. The species is said to feed upon the pea aphis, melon aphis, clover aphis, German grain aphis, and the eggs of the Colorado potato beetle.

The following localities are represented by specimens in the Station collection. East Hartford, Hartford, New Haven, Stafford, Stratford and Woodmont.

The Spotted Lady Beetle. *Megilla fuscilabris* Muls.
(Erroneously *maculata* Deg., a tropical species.)

Color, wing-covers bright red or pink, each marked with

FIG. 22. The spotted lady beetle *Megilla fuscilabris*.

seven black spots as shown in figure 22, one spot at base and another at the apical third joining the inner margin and ap-

pearing as common to both wing-covers. Thorax red or pink on front and lateral margins and median band leaving two triangular black spots. Head black with a red median stripe. Legs and undersurface of body, black. Longer, narrower, less convex and brighter color than most kinds of lady beetles.

Length, 4.5 to 5.5 mm.

The larva is dark gray or nearly black: prothorax black with rear margin and median line, white; meso-thorax and meta-thorax whitish with a pair of large oval black spots on each. First and fourth abdominal segments, whitish the first with an oblong transverse spot.

The spotted lady beetle is known to feed upon the pea aphis, melon aphis, cabbage aphis, currant aphis, spring grain aphis or "green bug", German grain aphis, chinch bug, eggs of Colorado beetle, and cotton boll worm, larvæ of asparagus beetle and cottonwood leaf beetle. It is also reported as eating pollen and fungus spores, and in 1883 was said to injure corn in Fairfield, Conn. by eating into the soft kernels. The injury was slight, however.

The spotted lady beetle hibernates in moderate numbers under rubbish. It is one of our most beneficial lady beetles, and is found throughout the state.

Our specimens are from Fairfield, Guilford, Hartford, Lyme, Meriden, Milford, New Haven, Norwalk, Warehouse Point, West Hartford and Yalesville.

Anisosticta seriata Mels.

Color, wing-covers yellow, marked like *M. fuscilabris*, but with the black spots larger and run together. Thorax black

FIG. 23. *Anisosticta seriata.*

FIG. 24. *Anisosticta strigata.*

with front and lateral margins yellow. Head and legs black. Undersurface of body black with yellow on prothorax and margins of abdomen. See figure 23.

Length, 5 to 6 mm.

Little is apparently known regarding the immature stages, life history, or food habits of this lady beetle. Smith states that it is locally common on aphid-infested goldenrod and in swamps in Southern New Jersey. Not common in Connecticut.

The few specimens in the Station collection were taken in New Haven and Woodmont.

Anisosticta strigata Thunb.

Color, wing-covers, thorax and head, light yellow, marked with black spots as shown in figure 24. Underside of body black, legs light yellowish brown.

Length, 3 to 4 mm.

Apparently little is known about the immature stages of this insect; in fact it will be seldom seen except by collectors. No data could be found regarding its food habits.

The Station collection contains specimens from Hamden, New Haven and Orange.

Besides the species of lady beetles just mentioned, we may expect also to find in Connecticut more than one species of *Brachyacantha,* six being listed from New Jersey; and several forms of *Hyperaspis* of which eight are recorded from New Jersey. We may also fairly expect to find *Neomysia pullata* Say., which resembles *Cycloneda munda* though larger (6 to 7 mm.) and with different thoracic markings, and occurs on pine trees. It is also recorded from both Massachusetts and New Jersey.

There are also a few other genera particularly *Axion* and *Exochomus,* examples of which will probably be found in Connecticut.

SUMMARY.

On the whole lady beetles are of great benefit to plant growers because they feed upon and destroy many noxious insects, especially plant lice and scale insects. There are about 250 different kinds in this country and over 30 in Connecticut.

Many persons do not recognize them as friends. They should not be destroyed.

In California certain kinds have cleaned up aphis infested fields and scale infested orchards. In Connecticut two kinds feed commonly upon the San José Scale.

Most kinds are more or less hemispherical in shape, red, yellow or black in color and spotted. Exceptions exist of course. The only species causing prominent injury in Connecticut is the squash lady beetle which devours squash leaves.

The commonest kinds are described and figured in the foregoing pages of this bulletin.